

-28-

CLAIMS

1. A data merge unit for providing an interleaved data stream, the data stream including data frames received on
5 two or more input channels, wherein complete data frames from each of the two or more input channels are arranged in time-slots of the interleaved data stream, the data merge unit comprising:
- an input unit to receive data frames from two or more
10 input channels;
- a frame merge buffer arranged to receive data frames from the two or more input channels via the input unit and store said data frames; and,
- an output generator to generate the interleaved data
15 stream, the output generator being configured to select complete data frames from the frame merge buffer and arrange said complete data frames in the interleaved data stream.
- 20 2. A data merge unit according to claim 1, in which the input unit is arranged to identify the end of each of said data frames and generate a pointer to identify the location of the end of each of said data frames in the frame merge buffer, for use in generating the interleaved data stream.
- 25 3. A data merge unit according to claim 1, in which the output generator is operable in a first mode to select complete data frames in the frame merge buffer from an identified input channel and output the selected frames in
30 a corresponding time-slot of the interleaved data stream for that input channel independently of other input channels and, in a second mode in which complete data frames from two or more of the two or more input channels

are selected from the frame merge buffer and merged and provided in a common time-slot of the interleaved data stream.

5 4. A data merge unit according to claim 3, in which when operating in the second mode, a look up table of values is provided to identify one or more complete data frames from one or more input channels for transfer from the frame merge buffer for merging with one or more complete data
10 frames from one or more other input channels in a common time-slot of the interleaved data stream.

5. A data merge unit according to claim 4, in which the look up table of values is generated in dependence on the
15 identified ends of the data frames.

6. A data merge unit according to claim 5, in which each entry in the look up table comprises an identified input channel, each entry corresponding to the end of a data
20 frame received on the corresponding identified input channel.

7. A data merge unit according to claim 6, in which as data is received by the frame merge buffer, if it is
25 determined that a component data word of a data frame is the last word of the frame, a corresponding entry is made in the look up table.

8. A data merge unit according to any of claims 1 to 7,
30 in which the input unit comprises a round-robin input arbiter arranged to service each of the two or more input channels and provide data frames therefrom to the frame merge buffer.

9. A data merge unit according to claim 4, in which the output generator comprises a round-robin output arbiter arranged, when the data merge unit is operating in the
5 second mode, to read and output a complete data frame from a corresponding input channel in the frame merge buffer in dependence on values obtained from the look up table.

10. A data merge unit according to any of claims 1 to 9,
10 the data merge unit being a hardware data merge unit.

11. A data merge unit according to claim 10, in which the data merge unit is arranged in hardware selected from the group consisting of one or more Application Specific
15 Integrated Circuits, one or more Field Programmable Gate Arrays, or any other suitably configured hardware.

12. A network analyser, comprising:
a data merge unit according to any of claims 1 to 11;
20 and,
a logic unit to analyse the interleaved data stream provided by said data merge unit.

13. A network analyser according to claim 12, in which the
25 logic unit is configured to provide one or more functions selected from the group consisting of network management and network load balancing.

14. A method of producing an interleaved data stream of
30 data frames received on two or more input channels, the interleaved data stream being made up of complete data frames from each of the two or more input channels arranged in defined time-slots, the method comprising:

-31-

receiving one or more data frames on two or more input channels;

storing said received data frames in a frame merge buffer; and,

5 selecting complete data frames from the frame merge buffer and arranging said complete data frames in the interleaved data stream.

15. A method according to claim 14, in which the method
10 comprises:

storing a pointer to identify the end of each of said received data frames; and,

using said stored pointers to generate said interleaved data stream.

15

16. A method according to claims 14 or 15, in which the method comprises:

in a first mode outputting complete data frames from a selected input channel in a corresponding time-slot of the
20 interleaved data stream for that input channel independently of other input channels and in a second mode merging complete data frames from at least two of the two or more input channels and providing said merged data in a common time-slot of the interleaved data stream.

25

17. A method according to claim 16, in which when operating in the second mode, a look up table of values is provided and used to identify one or more complete data frames from one or more input channels for transfer from
30 the frame merge buffer for merging with one or more complete data frames from one or more other input channels in a common time-slot of the interleaved data stream.

-32-

18. A method according to claim 17, in which values in the look up table are generated in dependence on ends of data frames.

5

19. A method according to any of claims 14 to 18, in which the interleaved data stream is generated at full line rate of the input channels.

10 20. A method of analysing a network, the method comprising:

producing an interleaved data stream of complete data frames received on two or more input channels according to the method of any of claims 14 to 19, the data channels

15 associated with a network to be analysed;

providing said interleaved data stream to logic to analyse said data stream; and,

analysing said data stream, thereby analysing the network.

20

21. A data merge unit, comprising:

input means to receive data frames from two or more input channels;

data merge means to merge complete data frames
25 received from the two or more input channels into a time division multiplexed interleaved data stream, wherein the data merge unit is arranged in hardware.

22. A data merge unit according to claim 21, in which the
30 hardware is selected from the group consisting of one or more Application Specific Integrated Circuits, one or more Field Programmable Gate Arrays, or any other suitably configured hardware.

23. A data merge unit according to claim 21 or 22, in
which the data merge means is arranged when merging data
5 into the time division multiplexed interleaved data stream
to ensure only complete data frames are provided in the
time division multiplexed interleaved data stream.